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Artificial Respiration.—Seven different forms of mechanical artificial respiration were studied in animal experiments for their influence on the pulmonary and systemic blood pressure. The trachea of the animal was cannulated to insure a free airway. Balloons were inserted into the thoracic and abdominal cavities in order to record changes in the pressure relationship. The gross and net pressures in the pulmonary and coronary arteries were measured by special arrangements in the not operated on and unanesthetized animal. Sounds were inserted into the right and left ventricles. Various degrees of reduced cardiac activity with severe depression or complete arrest of respiration were produced by various methods. Recovery of the animal was accomplished when respiratory arrest and slow weak cardiac contractions were produced with helium regardless of the method of mechanical respiration employed. Only insignificant changes in pulmonary and systemic blood pressure were observed when cardiac and respiratory arrest occurred, either by helium or by electrically induced ventricular fibrillation. The blood flow produced by the resuscitator did not reach the coronary and cerebral arteries. The so-called "milking action" of the intrapulmonic positive-negative type of resuscitator did not effectively increase the return of blood to the heart.—*Influence of Different Forms of Mechanical Artificial Respiration on the Pulmonary and Systemic Blood Pressure, P. P. Volpitto, R. A. Woodbury & B. E. Abreu, J. A. M. A., December 23, 1944, 126: 1066.*—(*H. Abeles*)

Mass Surveys.—The material consisted mostly of selective service registrants between 18 and 35 years of age. The majority were from the South and, of these southerners, 47.1 per cent were colored. There were 223,-182 stereoscopic 4 x 5 films taken; 14 x 17 X-ray films were taken of all suspicious cases. The incidence of disabling chest diseases, both of a permanent and temporary nature, was 1.018 per cent. Active tuberculosis was found in 0.3284 per cent. It is emphasized that known cases of active tuberculosis are placed in 4-F by local draft boards and not sent to the induction stations for examination. Prognoses were attempted on the following basis: minimal involvement in one or both lungs was considered to have a good prognosis, moderately advanced or far advanced disease confined to one lung was also considered to have a good prognosis, moderately advanced or far advanced disease in one lung associated with either minimal or moderately advanced disease in the contralateral lung was considered to have a fair prognosis, and bilateral far advanced disease was considered to have a poor prognosis. On this basis, 77.4 per cent were considered to have a good prognosis, 3.8 per cent a fair prognosis, and 17.9 per cent a poor prognosis. All chest rejectees from Mississippi were sent to the State Sanatorium for observation and follow-up by county health authorities. One group included in the study consisted of soldiers to be discharged for dependency or over-age. Of these, 0.8 per cent were found to have a disabling chest disease. None had had symptoms sufficient to have warranted investigation by their regimental medical officers. Routine chest X-rays films were not being made when these soldiers entered the Army. In a group whose physical examinations were

complete before the X-ray films were read, only 12.7 per cent of those with rejectable chest disease had shown significant physical signs. Only 14 out of every 100 cases of active tuberculosis would have been suspected from physical examination alone. No account was made of the incidence of minor calcified deposits, but a check on 5,000 plates chosen at random with this in mind revealed an incidence of 38 per cent. Only the films with marked calcification were noted; 0.016 per cent had dextrocardia. One out of every 140 had some congenital rib anomaly. This is an incidence of 0.7133 per cent. There were 452 cases of cervical ribs. There was no relation between the presence of rib defects and the incidence of disqualifying lung diseases. One hundred and fifty-nine cases of disqualifying severe pleural involvement were found; 31 of these had calcified deposits in the pleura. There were 6 diaphragmatic herniae, all proved by barium meal. Five were on the left side. There were 28 cases of pneumothorax simplex without apparent cause. The author pointed out that the majority of the cases of active tuberculosis were found early and treatable, demonstrating the excellence and practicability of mass X-ray technique in case-finding.—*The Chest X-ray, Major D. G. Morse, F.C.C.P., Dis. of Chest, November–December, 1944, 10: 515.*—(*K. R. Boucot*)

Photofluorography for Chest Surveys.—The problem of the detection and control of tuberculosis is of paramount importance to the government and the civilian. An important factor in the control of tuberculosis is the finding of the unsuspected case and the placing of such cases under proper supervision. Of prime concern are the minimal cases who are asymptomatic and unknowingly jeopardize themselves and those with whom they come in contact. Formerly surveys were impractical because of the expense. However, photofluorography is not only a relatively inexpensive method, but is practical, adequate and reliable. While others have written in this vein, the author writes to further confirm this impression, and, therefore, has reviewed his work, as roentgenologist at the Great Lakes Naval Training Station. Of the four methods of conducting surveys, that is, the use of standard 14 x 17 inch films, the use of 14 x 17 inch paper, photofluorography using 4 x 5 inch films with stereoscopic views and photofluorography using 35 mm. films, the author believes that the photofluorographic method using the 4 x 5 inch film is the most adequate. In its favor is the low cost, the rapidity per case, simplified filing and the reliability of the film for interpretation. He feels that the percentage of error should be as low as that with the large film. These films can be read without magnification and without undue eye strain. The 35 mm. film was the type used at the Great Lakes Station. The X-ray machine was a standard two hundred milliampere one with a movable tube stand. The photofluorographic unit was equipped with a large Leica with a film capacity of thirty feet and having a 1–5 lens. The screen distance was thirty-six inches and the tube-film distance forty inches. The tube and camera were fixed in place, the patient being raised or lowered in front of the screen by means of an electric elevator. One hundred foot rolls of film were cut into thirty-three foot lengths, each filling of the camera caring for two hundred exposures. The time consumed in processing the film, using standard solutions, was about one hour. Usually an average of 240 cases an hour was maintained, though on a few occasions as many as 420 per hour were cared for. However, the 240 per hour was more economical as far as wear and tear on the tube is concerned, the average life of a tube being 5,700 exposures. The speed of interpretation with brief reports was about 400 per hour. If anything of a suspicious or pathological nature was noted in the microfilm, the man was rechecked with a 14 x 17 inch film. If the findings were important, the patient was referred to the Naval Hospital for disposition. At the hospital he was given a thorough examination and the case referred to the Medical Examiners Board for

final decision. When active tuberculosis was found, the patient was sent home, the Board of Health in his home town notified of the facts by the Red Cross, and they in turn saw that he had proper care. A careful record of all such cases was kept. There were 400,263 cases X-rayed. These represented a good cross-section of the male population of the country including men from all walks of life. Their ages ranged from 17 to 45 with the majority between 17 and 35. The accuracy of the films was checked as films and reports were returned from the hospital at the end of each month with data concerning the correct diagnosis and disposition of the patient. Taking two representative months, the total films rechecked with a 14 x 17 film was 317, 112 of which were sent to the hospital for disposition and confirmation. The number confirmed was 96 (85.7 per cent), the number of diagnosis changed was 16 (14.28 per cent). These included 7 active tuberculosis changed to inactive, 3 pneumonitis changed to atypical pneumonia, 2 tuberculosis changed to atypical pneumonia and 4 inactive primary tuberculosis of possible significance to no significance. These errors in judgment were somewhat excusable as the diagnoses were made from the X-ray films alone with no history or clinical data. Consequently, most diagnoses were made as pessimistic as possible. Since the beginning of the survey, 6 patients with negative diagnoses have been hospitalized with active tuberculosis. There are two possibilities as to why these were missed, first, the size of the lesion and the smallness of the X-ray film, or, second, the first diagnosis was correct and the condition developed after entry into the service. There is no doubt that this survey was of value, for 897 of the 400,263 men examined were discharged from the service with tuberculosis. All have been placed under proper treatment which is of importance to the patient and his contacts. For each case it was estimated that it has saved the government twenty-five thousand dollars. Even though the 35 mm. film does not approach the accuracy of the larger 14 x 17 inch film, it is adequate enough for practical purposes. It is conceivable that some day a system may be devised whereby the entire population of a community may be surveyed with the result that active cases can be isolated and so supervised as to make the incidence of tuberculosis insignificant. — *Photofluorography for Chest Surveys, M. W. Mason, Radiology, November, 1944, 43: 499.—(G. F. Mitchell)*

Tuberculosis in Armed Forces—In World War I many thousands of tuberculous soldiers were inducted into service because of inadequacy of methods of detecting the disease. X-ray examination was not always done when mobilization began in 1940. Not until 1942, and only after approximately one million men had been admitted without X-ray examination, did this procedure become universal. The objective of physical standards in both the Army and the Navy was to exclude all active tuberculosis and all inactive disease that might be reactivated under strain of military duty. These criteria are briefly reviewed and note is made of the fact that at first these standards were quite rigid, especially in relation to calcified primary lesions. These were later liberalized. These varying standards affected the rejection rates at different periods. Thus early in 1942 the rejection rate was about 16 per 1,000. In the latter part of 1942 it dropped to about 10 with the liberalization of the standards for admission. The rate of rejectees was higher among white than among colored recruits and, in 1943, it was higher for women than for men. At first not all cases rejected for tuberculosis were reported to the state health boards. Later this was made compulsory. Films of accepted men at the time of induction are filed at the Veterans Bureau. Every soldier is X-rayed before discharge. Comparison can thus be made between the initial and final status of every man in the armed forces. During the course of the present conflict the admission rate for tuberculosis has been approximately one-tenth of that of World War I. This decrease reflects the lower incidence of tuberculosis in the general popu-

lation but especially the greater efficiency of modern procedures in excluding cases at the time of induction. The highest rate was 3 per thousand in 1941 and represents a large number who had been inducted during the early phase of mobilization without adequate X-ray control. The admission rate for tuberculosis overseas is lower than for troops in continental United States as the former represent a more selected group. A comparison of the X-ray films of men at the time of their breakdown with tuberculosis with their induction films reveals, in the majority of instances, that the disease had already been present at the time of induction but was missed. The rate of discharge for tuberculosis from the Army has varied from 2 to 0.5 per thousand. Early in 1942 it was high, later with changes in policy in relation to retention of cases of inactive tuberculosis for limited service this rate fell to the lower figure noted above with approximately 3,500 discharges per year in an army of 7,000,000 soldiers. It is noteworthy that the discharge rate for tuberculosis increases with the age of the individuals. Thus, while only 0.30 per thousand under 20 are discharged, 1.32 of 35 to 39 years are discharged for tuberculosis. All army and naval personnel are X-rayed before release from active duty. While the Army requires the separation of men with tuberculosis from the service as soon as practicable, men are temporarily hospitalized before discharge and before their allocation to the Veterans Administration.—*Tuberculosis in the Armed Forces, E. R. Long, Col. (MC), & E. A. Lew, Major, MAC, Am. J. Pub. Health, May, 1945, 35: 469.*—(*M. B. Lurie*)

Tuberculosis in the Army.—In Switzerland the problem of tuberculosis in the army may well be divided into three phases: (*1*) Prophylaxis. This comprises the detection of tuberculous men prior to induction and the prompt diagnosis and exclusion from further duty of those who develop the disease while in service. (*2*) Treatment. The Army Insurance System pays for the care and rehabilitation of all men who developed tuberculosis while in the service. (*3*) The problem of the custodial case. No adequate solution of this most important problem is in operation at this time. It is considered vital that custodial cases be given an opportunity to work and be useful during the remaining years of life instead of being condemned to years of invalidism without doing useful work. The following plan is suggested: In close connection with existing army sanatoria, yet separate from an administrative point of view, settlements are to be constructed. Here the chronically active, quiescent or custodial cases live together in small houses in homelike surroundings free from the rigid restrictions of sanatorium life. Work tolerance is determined by the physician who is the only link between the sanatorium and the settlement. This facilitates medical supervision and readmission to the sanatorium if and when this becomes necessary. The Army Insurance System cannot undertake the financial support of these settlements, but it is believed that public funds should be made available for this purpose. The average Swiss citizen is thereby given a chance to pay off a debt of gratitude to those who became hopelessly ill in the service of their country.—*Tuberkulose und Armee im Aktivdienst 1939 und in den folgenden Jahren, M. Voute, Schweiz. med. Wchnschr., July 22, 1944, 74: 786.*—(*H. Marcus*)

Tuberculosis in Amazon Region.—A comparative study of the number of deaths caused by malaria and tuberculosis carried out in Manaus, capital of the Brazilian estate of Amazomas, showed that, from 1922 to 1943, 4,952 people died of tuberculosis and 7,871 of malaria. The percentage in relationship to the total death rate was 21.41 for malaria and 13.47 for tuberculosis. The figures per year show an increase in the tuberculosis mortality and a decrease in the malaria mortality. The data are subject to several sources of error. The average rate of mor-

tality caused by tuberculosis in the last five years was the following in some Brazilian cities:

1st—Vitoria: more than 500 per 100,000 inhabitants
2nd—Salvador: more than 500 per 100,000 inhabitants
3rd—Recife: more than 441 per 100,000 inhabitants
4th—Manaus: more than 422 per 100,000 inhabitants
5th—Belem: more than 388 per 100,000 inhabitants
6th—Portoalegre: more than 373 per 100,000 inhabitants
7th—Rio: more than 322 per 100,000 inhabitants

The influence on tuberculosis of the diseases prevalent in that region is studied. Tuberculosis, which was brought from Europe to this region, spread rapidly in this part of the country, favored by economic factors, underfeeding, climate, etc. So far, despite the efforts made by the Liga Amazonense contra la Tuberculose, very little has been accomplished in the fight against the disease in the Amazonas.—*Tuberculose no Amazonas, D. Batista, Rev. brasil. de tuberc., July–August, 1944, **94:** 203.—(P. B. Franca)*

Fight against Tuberculosis in Brazil.—Tuberculosis did not exist among the Brazilian Indians when the country was discovered, but was introduced by the first European settlers. The disease spread rapidly and has been a subject of great concern to the government. In 1941 the National Service of Tuberculosis was established; its chief purposes are to study the problems related to tuberculosis, to organize prophylaxis, to supervise the governmental and private institutions devoted to the fight against tuberculosis, etc. In the first three years of its existence this service built and inaugurated several sanatoria, with a total of 2,030 beds; three other sanatoria, with a total of 800 beds, were built but are not yet open; other sanatoria with a total of 1,980 beds are being built. Other details of the organization are given.—*Servico nacional de tuberculose, S. Libanio, J. d. clin., August, 1944, **8:** 259.—(P. B. Franca)*

Tuberculosis Mortality in Guayaquil.—The general death rate in the City of Guayaquil in recent years has been extremely high. The tuberculosis death rate is very high. In the ten-year period from 1932 to 1941, 8,064 residents of the city died from tuberculosis. The death rate for tuberculosis rose from 486.5 in 1932 to 655.0 in 1941. These figures are comparable with those of London in 1740 and Edinburgh in 1793. The city is in that phase known in tuberculosis epidemiology as the "phase of massive tuberculization" (Sayé) or "epidemic" (Hofbrauer). The highest mortality from tuberculosis is at the age of 20 to 24 years. The mortality from tuberculosis in relation to the general mortality between 1932 and 1941 was between 15.64 per cent (1932) and 20.00 per cent (1937). The death rate in different age groups is almost the same in males and females. Deaths from extrapulmonary tuberculosis in relation to pulmonary tuberculosis were 24.5 per cent in 1934 and 9.1 per cent in 1941. This decrease in the extrapulmonary forms is probably due to the increasing use of pasteurized milk. Tuberculosis was the principal cause of death from 1932 to 1939, when it ceded the first place to the diarrheas and enteritis, not by a decrease of the former, but by an increase of the latter.—*Statistical Study of the Tuberculosis Mortality in Guayaquil, Ecuador (South America), J. A. Higgins, Rev. Ecuatoriana de hig. y med. trop., January, 1944, **1:** 34.—(G. C. Leiner)*

Tuberculin.—Four factors are important in the evaluation of tuberculin skin tests: (*1*) way of testing; (*2*) amount of tuberculin used; (*3*) interpretation of reactions; (*4*) strength of tuberculin. Nineteen different tuberculins were tested and were found to vary so greatly in their strength that the necessity to arrive at a standardization in order to

obtain comparable results appears to be of utmost importance. The "Tuberculin Unit" which is the unit of weight corresponding to 0.01 mg. of the "Old Tuberculin" prepared by the Serologic Institute in Copenhagen is accepted as standard. The Mantoux reaction is superior to all other procedures, if it is carried out correctly. Out of 366 children thus tested 92 had a positive skin test after the first dose, 33 responded to the second and 10 to the third injection.—*Tuberculines et réactions tuberculiniques, P. Hauduroy, Presse méd., January, 1945, 2: 13.*—(*G. Simmons*)

Tuberculosis in Infant.—The development of the primary complex is the most serious problem of the infantile organism. If all the defenses of the organism work well the primary focus will be prevented from breaking down. But if the bacilli intrude further than the primary complex, a general infection by lymphatic, bronchogenic or hematogenic ways will take place. Transition forms between the benign and the malignant childhood type of tuberculosis exist. A change from a primary benign type to a malignant type can be detected in X-ray series only because the infiltrate in the beginning looks alike in both forms. There are several causes which determine whether the primary infection will be benign or malignant: (*1*) The age of the child. The caseous pneumonic and bronchopneumonic forms are more frequent in the first than in the second year of life and even more frequent in the first six months. (*2*) The virulence of the bacilli. (*3*) The intensity and repetition of the contact. Massive repeated exposures to contacts, that is, family contacts, give a poorer prognosis than sporadic contacts. (*4*) Hygienic and nutritional factors. Breast-fed infants offer a better resistance than artificially fed, unless the mother is the source of the infection. (*5*) Intercurrent diseases. Measles, whooping cough, influenza, malaria convey to the child an anergy to tuberculosis. (*6*) The nonspecific resistance of the organisms in relation with hereditary factors. The author gives the *intra vitam* and autopsy findings of 30 cases of tuberculous caseous pneumonia and bronchopneumonia which have to be considered as primary infections. The age of the children at their deaths was between 3 months and 30 months. The average duration of the disease was three and a half months. It is rare to find purely pneumonic or bronchopneumonic lesions. Generally mixed lesions are found at autopsy. The caseous pneumonia extends over the entire lobe. It may progress from the primary complex, but sometimes it has no direct relation to it. An exacerbation of the glandular focus may give rise to a postprimary or secondary infiltrate which can develop into a malignant progressive form of tuberculosis. The clinical aspect may be that of a pneumonia with high fever, dyspnea, cough and signs of hepatization of the lung. Or the disease may come on insidiously with anorexia, subfebrile temperature, disturbances of the digestive tract and absence of physical findings. The appearance of erythema nodosum is pathognomonic. Both forms develop cavities and death occurs from cachexia, miliary tuberculosis or meningitis within one to six months. The X-ray film shows triangular shadows in one or more lobes radiating from the hilum or band-like densities extending from the hilum towards the axilla. Later on, when the caseous process is well advanced typical cavities can be seen. The caseous bronchopneumonia is an acute lesion which affects both lungs and leads rapidly to death. It may start like a banal bronchopneumonia. The only difference is the persistence of the foci, the long duration and the rapid deterioration of the general condition. Death occurs from within days to a few weeks, generally from cachexia. In some cases the beginning of the disease is masked by slight temperature, anorexia, diarrhea, anemia and loss of weight. This condition may last for months. Only X-ray and sputum findings may allow the exact diagnosis. The X-ray film shows always a great number of smaller or larger hazy spots, isolated or in groups. When these spots coalesce and soften a cavity forms. This is much more frequent than is general-

thought. The cavity in itself does not lead to death. Hemoptysis and spontaneous pneumothorax are very infrequent in infants, although the cavities are very large and generally subpleural. Therapeutic pneumothorax, although very difficult to institute, should always be tried. But generally the treatment does not succeed. There is strong evidence that certain infants present a natural specific resistance to the spread of the disease. —*Formas caseosas de la tuberculosis del lactante, J. R. Betancourt, Rev. cubana de tuberc., July–September, 1944, 8: 495.—(W. Swienty)*

Negative Tuberculin Tests in Children.—The problem of negative skin tests in children, who previously had reacted positively to the injection of tuberculin, was studied in 745 children of the age group 5 to 15. Skin tests were repeated every three months. In 17 of the children the previously positive skin test turned negative and the following causes for this phenomenon were found: (*1*) The first group of such children did not show any evidence of clinical or radiological tuberculosis and it is therefore assumed that these children had had a very slight infection which did not result in a primary focus. (*2*) In a second group of children the previously positive skin test became negative and stayed negative for some time until it turned positive again. Here the presence of healed lymph nodes was noted and it is admitted that a reinfection had occurred. (*3*) The third group was composed of 2 cases of pleurisy and 2 patients with active pulmonary tuberculosis with poor prognosis. It is admitted, however, that differences may exist between the general sensitivity of the organism and that of the skin.—*Les éclipses cutanées à la tuberculine chez l'enfant, Bergeron, André, Bucquoy & Beust, Presse méd., 1942, 11: 553.—(G. Simmons)*

Cavernous Tuberculosis in Infant.—The remarkable case of an infant in whom the diagnosis of pulmonary tuberculosis was made on the basis of positive sputum examinations at the age of seven months is reported. X-ray films revealed a giant cavity in the upper part of the right lower lobe; ten months later the cavity had disappeared. The child was subsequently followed for eight years during which time physical examinations and X-ray films remained persistently negative.—*Guérison, controlée pendant 8 ans, d'une caverne pulmonaire géante apparue chez un nourrisson tuberculeux de 7 mois, R. Turpin & P. Chassagne, Rev. de la tuberc., 1942, 7: 42.—(G. Simmons)*

Primary Tuberculous Infection.—Inasmuch as it is difficult or impossible for tuberculosis institutions to hire only tuberculin-positive personnel, it has been the practice at the Cheshire Joint Sanatorium to employ tuberculin-negative personnel as well. Nurses and maids frequently hail from rural districts or from Ireland, and among them are a large number of non-reactors. It has been found impracticable and impossible to protect these people from infection, and therefore a system has been worked out whereby these people are given maximal supervision and care during the period of their primary infection. All employees have a thorough examination on entrance. This includes physical examination, taking of weight, sedimentation rate, chest X-ray and, of course, tuberculin test. All these tests are repeated at monthly intervals, except for X-raying, which is repeated every three months until Mantoux conversion. The cases naturally fall into four groups. *Group 1:* Mantoux conversion without X-ray evidence of a primary complex, without signs and symptoms of disease, and with a normal sedimentation rate. These cases continue to work, and they are observed for three months. *Group 2:* Asymptomatic cases, without evidence of hilar lymph node enlargement, but with elevated sedimentation rate. These cases are put on half duty for one month, and after that on full duty, and observed for three months, providing that the sedimentation rate becomes normal after the first month. *Group 3:* Asymptomatic, but with X-ray evidence of hilar enlargement, with or without primary complex. These patients are given bed-rest for one month, half duty for

three months, full duty thereafter provided that the nodes show satisfactory retrogression. *Group 4:* Those clinically ill and/or showing radiological signs other than a retrogressive primary complex. These cases are treated as long as indicated. Of a total of 340 new entrants, 72 were tuberculin-negative. Forty-eight out of these 72 showed Mantoux conversion. Thirty-three belonged in groups 1 and 2, 5 in group 3, and 9 in group 4. One case showed evidence of reinfection type of tuberculosis. Of the 10 cases that developed tuberculosis, all are well at this writing, and 7 of the 10 have been observed for a five-year period. None of the tuberculin-positive entrants developed tuberculosis within the seven-year period of this study.—*Primary Tuberculous Infection in a Sanatorium Staff, P. W. Edwards & A. C. Penman, Lancet, April 7, 1945, 248: 429.*—(*H. Marcus*)

Work in Tuberculosis.—The value of graduated exercise in the treatment of tuberculosis was not appreciated until Paterson put his views into effect between 1910 and 1916. Paterson's exercises were rigid and monotonous and lacked the stimulus of productive work. At Papworth, Sir Pendrill Varrier-Jones recognized the great psychological advantages of productive and profitable employment, but medical supervision was insufficient at times and the capacities of patients were incorrectly assessed. From these earliest experiments stem our present-day methods which recognize the need for productive work more than for diversional activities, and thus demonstrate the superiority of rehabilitation over simple occupational therapy. The patient is discharged cured only when, in addition to regaining his health, he has also made a new adjustment to normal life by learning an occupation which is compatible with his health. Employment of patients in sanatoria is urged, or in sheltered industries. Those that cannot be accommodated in this fashion should receive modified employment in normal industry.—*The Value of Work in Treatment of Tuberculosis, F. Heaf, Lancet, March 3, 1945, 248: 263.*—(*H. Marcus*)

Chest X-ray Examination.—The "hard", recumbent X-ray examination of the chest sometimes overcomes difficulties which are present in the routine views. The following technique is advised: "The patient lies flat on his back on the horizontal table with a Potter-Bucky diaphragm. The X-ray tube is brought into position and centered more or less on the middle of the body of the sternum. The distance is thirty inches. Other factors are 60 K. V., 90 M. A. and 1 second." The following results are obtained: (*1*) Pleural fluid spreads out. (*2*) Breasts flatten out. (*3*) The mediastinal structures are very well seen. (*4*) The bony thorax and its abnormalities are seen more clearly. (*5*) The position of the left diaphragm is marked by putting barium into the stomach. Cases are presented which show the advantages of this method.—*The Value of the "Hard" Recumbent X-ray Examination of the Chest, S. F. Oosthuizen, Clin. Proc. (Cape Town), January–March, 1945, 4: 11.*—(*G. C. Leiner*)

Lower Lung Field Tuberculosis.—Two thousand consecutive cases discharged between February, 1933 and February, 1942 were studied by X-ray. Cases were excluded for the following reasons: (*1*) infiltrations in the upper half of either lung, (*2*) primary tuberculosis, (*3*) bronchiectasis, (*4*) pleural effusion, and (*5*) pleural thickening unless concomitant parenchymatous tuberculosis was present. Of 2,354 cases discharged from the medical service of the Robert Koch Hospital, St. Louis, during the above period, 63, or 2.7 per cent, satisfied the above criteria. The incidence of basal tuberculosis as reported in the literature varies from 0.003 per cent to 18.3 per cent. The authors account for this wide variation on the basis of the type of sanatorium in which the studies were made. They suggest that the low figures come from large municipal sanatoria where patients are usually seen first in an advanced stage, while the higher incidence is reported by authors working with smaller and more select groups seen in earlier stages before spreads to the upper lung fields have occurred.

The sex distribution was two females to each male hospitalized in the same hospital for tuberculosis during the same period. There were 44, or 69.8 per cent, females, and 11, or 30.2 per cent, males. These findings are in agreement with the general preponderance of females to males noted in studies of lower lung field tuberculosis. There was no definite relationship so far as race was concerned. It was noted that 91.5 per cent of the cases occurred in patients under 40 years of age. However, in Negroes, 90 per cent of the cases were under 30 years of age. This is also in accord with findings reported in the literature. Of the basal lesions 58.7 per cent were present on the right side as contrasted to 41.3 per cent on the left side. In a consideration of stage of disease in the group with lower lung field tuberculosis and in the balance of the tuberculous hospital population, the following figures were found: 61.9 per cent far advanced in the basal group as contrasted with 72.9 per cent in the general group, 38.1 per cent moderately advanced in the basal group as contrasted with 22.6 per cent in the general group, and no minimal cases of lower lung field tuberculosis while there were 4.4 per cent of minimal cases in the general group. The authors account for the absence of a minimal group among those with basal tuberculosis on the basis of lack of recognition of minimal lower lung field tuberculosis. There was no essential difference in pathology nor symptomatology, except that there was a history of hemoptysis in 75 per cent of those with basal tuberculosis. Various collapse procedures were used. Of 4 cases treated by thoracoplasty, only one became arrested and, in that patient, the operation was begun with the lower ribs and carried upward. Approximately one-third of the group were arrested at the time of discharge, one-third died, and one-third left improved, quiescent or unimproved. These findings at discharge parallel those in other cases of pulmonary tuberculosis discharged from the Robert Koch Hospital.—*Lower Lung Field Tuberculosis, S. S. Romendick, B. Friedman & H. F. Schwartz, Dis. of Chest, November–December, 1944, 10: 481.*—(*K. R. Boucot*)

Prephthisical Tuberculosis. — The term prephthisical tuberculosis is applied to all tuberculous pulmonary lesions which precede the development of chronic pulmonary tuberculosis. The rôle of these lesions in the evolution of pulmonary tuberculosis is still under study. A large number of prephthisical lesions was recently discovered in mass X-ray surveys. Three criteria are given for their recognition: recently acquired tuberculin sensitiveness, recently passed simple pleurisy with effusion without parenchymal involvement, a stable X-ray lesion in the form of a round focus or a "smudge focus." Persons with any or all of these lesions continue to remain in good health over a protracted period of observation. Only very few of these lesions will progress to chronic pulmonary tuberculosis. The pros and cons of the new classification are discussed. Phthisical lesions demand immediate treatment, prephthisical lesions should be observed over a prolonged period of time. Since no adequate knowledge is available to distinguish the phthisical from the prephthisical lesions treatment will often have to be a compromise between overtreatment of the latter and inadequate treatment of the former. Individual consideration has to be given to the psychic and somatic state of the patient.—*Prephthisical Tuberculosis, E. Mayer & I. Rappaport, J. A. M. A., January 6, 1945, 127: 15.*—(*H. Abeles*)

The term "prephthisical infiltrate" was introduced into the tuberculosis literature more than a decade ago by Ulrici. He defined it as infiltrations in the initial phase of clinical tuberculosis which have not as yet shown evidence of tissue destruction, that is, "phthisical" developments. In other words, Ulrici's "prephthisical infiltrate" is the same as the so-called "early infiltrate" before cavitation has occurred. As such, it is likely to be unstable, either progressing to excavation or regressing by absorption and/or fibrosis. [Editor]

Bronchogenic Tuberculosis.—A primary complex is found in almost every case, regardless of natural resistance or any other condition except that primary infection has taken place. Late primary infection is prone, after a short time, to cause an Assmann focus. While it is theoretically possible that these foci are due to a new "exogenous reinfection," their quick succession upon primary infection and the interposition of small, disseminated, notably apical nodules suggest that all these are manifestations of the same infection. Although about 70 per cent of primary foci sterilize themselves after some years, sterilization is less effective, and takes a longer time in calcifying postprimary foci—and it is these which are outstandingly incriminated in bronchogenic tuberculosis due to recrudescence. Another evidence of "endogenous reinfection" is the common occurrence of solitary Assmann foci in cases of disseminated tuberculosis in which all manifestations are blood-borne. Endogenous reinfection by recrudescence of calcified foci is of less importance than it used to be at a time when the majority of primary infections were acquired in childhood. Endogenous reinfection nowadays does occur from comparatively fresh primary foci. Inborn resistance decides the severity of the infection in the individual. It does not decide the type in which tuberculosis manifests itself (primary, postprimary, disseminated, bronchogenic).—*The Origin of Bronchogenic Tuberculosis in the Adult, W. Pagel, Brit. M. J., December 16, 1944, 2: 791.*—(*D. H. Cohen*)

Generalized Tuberculosis.—An interesting case of generalized tuberculosis in a 26 year old seaman is presented. Onset was with headaches, chills and fever. During the course of the illness erythema nodosum developed. The interesting features were present in the X-ray and postmortem findings. The chest X-ray films revealed a left hilar opacity with density in the left midlung field and associated glandular enlargement. Subsequent films revealed a spread of the process on the left side and hilar involvement on the right side. The interesting features of the postmortem examination consisted in the finding of a large breaking-down caseous peribronchial lymph node in the left side of the mediastinum—the size of a tangerine. Tuberculous pericarditis was present. There was a solitary, large tubercle found in the myocardium of the right ventricle. There were many noncaseating tubercles in the liver, spleen and kidneys. The other organs were normal. The authors conclude that the disease was a blood-stream infection with a primary focus in the peribronchial lymph node. The size of the tubercles and the absence of macroscopic caseation speak for high resistance on the part of the patient.—*An Unusual Case of Generalized Tuberculosis, W. H. Mylechreest & I. M. Scott, Brit. M. J., November 25, 1944, 2: 693.*—(*D. H. Cohen*)

Tuberculin Therapy.—Tuberculin therapy was used in a great number of cases over a period of four years, but clinical results obtained cannot yet be evaluated. However, certain reactions were observed frequently and deserve further evaluation. There are: Acute transitory reactions. In addition to local, focal and general manifestations certain syndromes were observed which are grouped into two classes: (*A*) Syndromes due to fixation of tuberculin, which may be articular and range from arthralgies to true arthritides, or endocrine, manifesting themselves mainly as transient hyperthyroidism or adrenal insufficiency, or nervous, manifested by migraines, neuralgias and depressions. (*B*) Syndromes due to elimination of tuberculin, consisting mainly in hepatic dysfunctions ranging from a mild degree of transient hepatic insufficiency, as manifested by anorexia, nausea and indigestion, to an acute icteric state. These symptoms are definitely related to the amount of tuberculin given and to the time these injections were given. Tuberculin acts like a stimulus in the induction of a syndrome which the patient is subject to develop "spontaneously," that is, without the precipitating cause becoming manifest. The term "syndromic reaction" is suggested for

those symptoms that set in after the injection of tuberculin, that had existed some time previously and that the patient was apt to develop as a response to any adequate stimulus. The institution of an artificial pneumothorax decreases reactions to the injection of tuberculin. Tuberculin therapy is best tolerated in the absence of liver disturbances.—*De quelques incidents de la tuberculionothérapie et de leur signification, A. Jacquelin, A. Cornet & P. Villanova, Presse méd., August, 1941, No. 70/71, 884.*—(*G. Simmons*)

Histamine in Treatment of Sweating.—Fifteen cases of pulmonary tuberculosis in which profuse perspiration was one of the most distressing symptoms were treated with intracutaneous injections of increasing doses of histamine. The initial dose of 0.1 mg. was increased daily by 0.1 mg. until the maximum dose of 10 mg. was reached. The total amount given rarely exceeded 5 mg. In 10 patients thus treated perspiration ceased, 3 patients obtained "very considerable relief," whereas in the remaining 2 patients no noteworthy results were obtained. This therapeutic effect of histamine is attributed to a block of sympathetic nerve fibres supplying sweat glands. It is not a local effect only, because histamine injected intracutaneously enters the general circulation readily. The most striking fact in this study is that histamine injected over a short period of time is able to somehow modify the function of sympathetic nerve fibres or the sweat glands for a long time, just like small doses of atropine or acetylcholine give long lasting results in relief of pain in tabetic gastric crisis and in Raynaud's syndrome, respectively.—*Histamine et sueurs, F. Coste, M. LaMotte & G. Guiot, Presse méd., March, 1940, No. 22/23, 250.*—(*G. Simmons*)

Glucose Tolerance in Pulmonary Tuberculosis.—While in normal individuals hyperglycemic values obtained after the administration of varying amounts of glucose present only slight variations, in patients with pulmonary tuberculosis and toxemia such variations are more pronounced, the hyperglycemia being only slight if the amount of glucose ingested was small and being greater if more glucose was ingested. This is interpreted as a sign of impaired liver function. The difference of glycemic values of the capillary and venous blood after ingestion of glucose is slight in normal individuals. In afebrile patients this difference is very slight, if the amount of glucose ingested is slight and is equal to or greater than that encountered in normal individuals if the amount of glucose given is great. This difference of glycemic values was always very slight in toxic patients with high fever, and this is thought to be due either to decreased pancreatic function or to a marked muscular glycogenolysis.—*Le curve glicemiche differenziali capillari-venose provocate con carico vario di glucosio nei tuberculotici polmonari in stato di grave tossiemia, A. Baffoni, Ann. Ist. Carlo Forlanini, 1942, 6: 699.*—(*G. Simmons*)

Hypovitaminoses and Tuberculosis.—The relation between vitamin deficiencies and tuberculosis was studied in approximately 100 patients, most of them hospitalized for pulmonary and some for extrapulmonary tuberculosis. Vitamin C deficiencies were noted in 95.4 per cent of the tuberculous patients, whereas only 72 per cent of healthy individuals, kept on the same diet, had vitamin C hypovitaminosis. No relation between vitamin deficiency and pulmonary hemorrhage was noted. It was observed, on the other hand, that the deficiency increased with the progress of the pulmonary condition. No relation between gastro-intestinal disturbances and hypovitaminosis was noticed. Vitamin A deficiencies were noted in 33 per cent of the cases, whereas the percentage was higher in other patients hospitalized for diseases other than tuberculosis. This is ascribed to the fact that tuberculous patients are allowed extra butter and milk. Hypovitaminosis A was more frequent in extrapulmonary than in pulmonary tuberculosis and, contrary to what occurs in vitamin C deficiency, was always correctible by ad-

ministration of vitamin A. Vitamin B1 deficiency in tuberculous patients was found in 17 per cent and in other patients in 25 per cent. In all patients vitamin D deficiency was present in 23 per cent. It seems, therefore, that vitamin C deficiencies are most important and frequent in patients suffering from tuberculosis. This condition is partly due to deficient nutrition and partly to increased destruction of vitamin C, particularly in recent, progressive cases with extensive lesions.—*Tuberculosis et precarence, H. Wasembourg, P. Boulanger, J. Swyngedanw & J. Poiteau, Presse méd., 1942, No. 25.*—(*G. Simmons*)

Postural Drainage in Pulmonary Tuberculosis.—Postural therapy has proved valuable in the treatment of 131 cases of pulmonary tuberculosis. Of 46 cases in which postural therapy only was used, the result was good in 37 per cent, moderate in 26 per cent and none in 37 per cent. Postural therapy combined with phrenic paralysis gave good results in 30 per cent of 40 cases, moderate in 28 per cent and none in 42 per cent. In combination with an ineffective pneumothorax postural therapy was effectively used in 55 per cent of 31 cases. Pneumothorax, phrenic paralysis plus postural therapy gave good results in 4 out of 6 cases and of 8 thoracoplasty cases 4 were benefited by postural therapy. Credit for improvement of the clinical condition was given to postural therapy only after previous therapy had failed. The patients were started out in a supine position, subsequently the foot of the bed was raised from 20 to 30 cm. up to 60 cm. This postural therapy was maintained from three months up to more than a year, with an average of six to eight months. There are no special contraindications. Best results are obtained in recent cases and particularly in conjunction with a phrenic paralysis. In hypotensive patients the condition may grow worse. Postural therapy, it is concluded, should be used in all those cases in which the process of retraction is to be reinforced.—*La declivoterapia nel trattamento della tbc. polmonare, F. Tullini, Riv. di pat. e clin. d. tuberc., 1943, Vol. 16.*—(*G. Simmons*)

Tomography and Anatomical Findings.—In a patient who died of advanced pulmonary tuberculosis a series of tomographs was taken shortly after death and the X-ray findings compared with the autoptic material, which was frozen and then sectioned *in toto*. Thus each anatomical lesion could be compared with the picture obtained tomographically. The series of five tomographs and corresponding anatomical sections are presented in this paper. In two tomographs there appeared to be a small pneumothorax pocket, which anatomically, however, proved to be emphysematous lung tissue. A small cold abscess of a rib failed to become evident tomographically.—*Indagini comperative tra stratigrafia e reperti anatomici polmonari, C. Panà & G. Torelli, Ann. Ist. Carlo Forlanini, 1942, 6: 687.*—(*G. Simmons*)

False Cavitary Images.—Two cases demonstrating how false cavitary images may be due to abnormalities or superposition of images of normal pulmonary structures are presented. In the first case a multiloculated cavity was seen in the postero-anterior view, but no evidence of a cavity could be found on lateral views or on tomographs. The false image was due to a bony defect caused by an old bullet wound of the chest, which had produced fracture and subsequent abnormal osseous regeneration of a rib of the anterior and posterior aspect of the chest. In the second case a cavitary image with an apparent fluid level could not be detected on lateral views and tomographs proved that the image was due to vascular markings.—*A propos de deux images de fausses cavernes, R. Pruvost & Tiret, Presse méd., February, 1942, No. 17, 211.*—(*G. Simmons*)

Tuberculous Cavities.—Bacteria in tuberculous cavities in cadavers were studied. Ordinary bacteria, such as staphylococci, pneumococci and streptococci, were found in the purulent secretion covering the cavity

wall. In the cases of old cavities, tubercle bacilli were not found, whereas their presence was constantly revealed in fresh cavities. In the cavity wall itself, on the other hand, only tubercle bacilli, without secondary infection, were found. Regarding these findings, it is worth noting that secondary infection of the tuberculous tissue itself is rarely found; tuberculous tissue therefore seems to be particularly resistant to nontuberculous infections. This explains the very rare coexistence of tuberculosis and abscess of the lung.—*La flora microbiana de las cavernas tuberculosas pulmonares, A. A. Raimondi, R. Scartaschini & F. M. Gonzalez, Arch. argent. de tisiol., October–December, 1944, 20: 367.—(H. Behm)*

Tuberculosis in Twins.—The case history of two 48 year old mono-ovular twins is reported. Both had tuberculosis of the left kidney and bilateral tuberculous epididymitis. One of the twins developed epididymitis and renal tuberculosis at the age of 46, the other developed epididymitis at the age of 25 and tuberculosis of the kidney at 38. In both cases the tuberculosis of the kidney had started at the upper pole. The twins had lived in the same environment up to the age of 17.—*Urogenitaltuberkulose bei eineiigen Zwillingen. Erbarzt, C. H. Schroeder, München. med. Wchnschr., 1941, 9: 217.—(G. Simmons)*

Diasone.—The studies of a number of workers have shown that diasone has its place in the treatment of experimental and possibly clinical tuberculosis. It is stable and water soluble if protected from oxidation in vacuum glass ampules. Exposed to the air, an aqueous solution after a few minutes turns cloudy. Later a precipitate is formed because of the combined effect of carbon dioxide of the air and the oxidation of diasone, resulting in an increase of the acidity of the solution. By the addition of sodium bicarbonate or sodium hydroxide, the precipitated diasone can be redissolved. If diasone powder is exposed to air for several days part of it turns insoluble. Mixing diasone and solid sodium bicarbonate (9:1) maintains diasone unchanged and water soluble for a long period of time, provided it is kept in tightly closed bottles. Gastric juice normally containing from 0.4 to 0.5 per cent hydrochloric acid may act upon diasone, but it was proved by tests that in two hours 0.4 per cent hydrochloric acid at 37°C. causes neither the splitting off of formaldehyde sulfoxylate nor the liberation of diaminodiphenylsulfone. Diasone is sufficiently pure and uniform to be satisfactory in treating infected animals and human beings as well. This drug can be quantitatively estimated by diazotization and subsequent formation of a dye, according to a modification of a method of Bratton and Marshall. The chronic and acute toxicity of diasone tested orally and intravenously on mice, rats and rabbits is noticeably less than that of most well known sulfonamides, including sulfadiazine. It is far less toxic than diaminodiphenylsulfone. Diasone has shown high therapeutic effectiveness in mice infected with beta-hemolytic streptococcus as well as type II pneumococcus infection. At the present time, diasone is being investigated clinically in the treatment of tuberculosis.—*Diasone: Its Toxicity and Therapeutic Effectiveness, G. W. Raiziss, M. Severac & J. C. Moetsch, J. Lab. & Clin. Med., April, 1945, 30: 317.—(F. G. Petrik)*

Action of Extracts of Penicillium upon Experimental Tuberculosis.—Products of different species of *Penicillia* were tested from the point of view of their bacteriostatic action on tubercle bacilli *in vitro*, of their inhibitory action upon the formation of the tubercle in the chorio-allantoic membrane of the chick embryo, and of their chemotherapeutic action on the experimental tuberculosis of the guinea pig. Penicillin and Penatin did not prevent the growth of tubercle bacillus *in vitro*. Aqueous solution of the ethereal extract of *P. notatum Ravlin Thom.* showed *in vitro* marked activity in certain concentrations; similar extracts of *P. cyclopium* were inactive under the same conditions. All the preparations tested proved to have some inhibitory

action on the formation of tubercles in the chorio-allantoic membrane, but did not show a reduction in the incidence of the infection. Neither penicillin (Florey) nor extracts of the culture media of *P. cyclopium* showed any activity against experimental tuberculosis in guinea pigs. Very little results in this respect were obtained with extracts of culture media of *P. notatum Ravlin Thom.*—*A Acao dos extractos de penicillium na tuberculose experimental, M. I. Smith & E. W. Emmart, Rev. brasil. de tuberc., September–October, 1944, 95: 331.*—(*P. B. Franca*)

Broncholithiasis.—In a patient subject to recurrent attacks of bronchitis with bloody expectoration, broncholithiasis is to be considered. Expectoration of calcified portions of lymph nodes, or even pulmonary foci, may be protracted over a number of months or years. The individual stones may be so small as to be missed entirely unless the condition is suspected and the patient is instructed to look for them. In its symptomatology the condition closely resembles Castellani's bronchospirochetosis. The sputum will frequently contain a sufficient number of spirochetes from the mouth so that examination of the sputum obtained by bronchoscopic aspiration is essential. Bronchoscopy usually shows a nonspecific inflammation with ulceration and granulation tissue at the point of the breakthrough. Two cases are presented. One was temporarily bettered by a course of arsenicals thereby adding to the difficulty in differentiating the disease from bronchospirochetosis. Neither case developed evidence of tuberculous spread during the time of observation, nor was there any evidence of active tuberculous disease.—*Ueber zwei Fälle von Broncholithiasis. Zur Differentialdiagnose der Bronchospirochaetosis Castellani, E. Zweifel, Schweiz. med. Wchnschr., August 5, 1944, 74: 833.*—(*H. Marcus*)

Bronchial Stenosis.—Tuberculosis is a frequent cause of bronchial stenosis. A careful history and physical examination, X-ray and bronchographic studies and laboratory investigations are of great help in establishing the diagnosis of bronchial stenosis. Bronchoscopy, especially if completed by biopsy, is decisive in corroborating and specifying the diagnosis. In the sanatorium of Huipulco bronchoscopy is a routine examination before and after thoracoplasty, in cases with positive sputum with no evidence of parenchymatous lesions, in cases of hemoptysis without evidence of pulmonary disease, and finally in the presence of bronchial stenosis. In 207 bronchoscopies, 58 cases of bronchial tuberculosis were found. Four cases are reported, illustrating some of the possible causes of bronchial stenosis besides tuberculosis, such as, syphilitic mediastinitis, traumatic lesions affecting the bronchi or peribronchial structures, nonspecific bronchopulmonary processes.—*Contribucion al estudio te la estenosis bronquial, J. C. Villegas, Rev. mex. de tuberc., December, 1943, 5: 165.*—(*L. Molnar*)

Hemorrhagic Tracheobronchitis.—Hemorrhagic tracheobronchitis, diagnosed in several cases, is considered secondary to lymph node tuberculosis, itself secondary to an active or inactive pulmonary focus. Tracheobronchial hemorrhages may occur in all phases of pulmonary tuberculosis. These hemorrhages are scant, the blood is red and without foam. The patient's general condition remains good, there is no elevation of temperature and the physical examination is, as a rule, negative. In women such hemorrhages frequently occur during menstrual periods. Bronchoscopically one sees small areas with ill defined borders, where the mucosa is thickened, infiltrated, highly hyperemic. In a later stage these areas become sclerotic and newly formed vessels become apparent. Sometimes such foci are multiple, but as a rule they are isolated and are most frequently found just above or below the carina. They are in relation to an inflamatory process of the airways secondary to tuberculosis of adjacent lymph nodes.—*Trachéobronchite hémorrhagique et tuberculose ganglio-pulmonaire, A. Dufourt & P. Mounier-Kuhn, Presse méd., January, 1943, No. 3, 26.*—(*G. Simmons*)

Pathological Granulations in Leucocytes.—Although the occurrence of so-called toxic or pathological granulations in neutrophil leucocytes in the course of various infectious diseases and intoxications has been known for some time, only recently Benda started a study of this granulogenesis in its relationship to tuberculosis. It was found that in tuberculous patients these granulations, once established, are a permanent feature and present modifications paralleling the clinical course of the disease in man. The amphophil granulations, which normally are very fine and are equally distributed in the clear protoplasma of neutrophil leucocytes, are, under pathological conditions, bigger, irregular, agglomerated at the periphery of the cell and appear in larger numbers. The leucocytes are increased in size. According to the number and volume of the granulations, the leucocytes are divided into three groups: (*1*) type G++, the extreme type; (*2*) type G+, the medium type; and (*3*) type G±, the intermediate type. Frequently the predominance of either type is evident; sometimes, however, more types coexist in the same individual and the predominance of either type must be expressed in percentage. The granulogram $\frac{(G++)+(G+)+(G\pm)}{GN}$ expresses the relation between the different types of abnormal leucocytes and the normal leucocytes. Such granulations can be produced artificially by injecting experimental animals with pathological material such as sputum and pleural fluid; the type of granulation observed is then dependent upon the virulence of the injected material. In all cases of reinfection tuberculosis in which bacilli can be found easily and persistently, the granulations are constantly present. Most frequently type G++, very often type G+ is observed, whereas type G± was never found. In arrested cases and in cases of primary tuberculosis with persistently negative sputum the granulations are frequently of the intermediate type G±. In patients suffering from conditions other than tuberculosis, the granulations remain normal. This is true for certain conditions that are important for the differential diagnosis of tuberculosis (acute pneumococcic pneumonia, acute rheumatic fever, subacute bacterial endocarditis, bronchogenic carcinoma, leukemia etc.). In 3 cases of leprosy and in 3 cases of Hodgkin's disease the granulations remained normal, too. In typhoid fever the granulations are frequently of the G+ type but their appearance is only temporary. In one case of Besnier-Boeck's disease the granulations were of the intermediate type, but showed daily variations. After inoculation of pathological material (sputum, pleural and spinal fluid) into guinea pigs characteristic changes in the granulations occur. Between the tenth and fifteenth day after the injection of material, negative microscopically, but obtained from a tuberculous patient, characteristic changes in the granulations occur. They become of the G± and later G+ or even G++ type. It seems, therefore, that the type of granulation observed in the animal eventually is identical with that of the patient whose material was inoculated. If the animal is inoculated with an attenuated strain, G± granulations can be seen, which, however, disappear after a certain time. If dead bacilli or their lipid or fatty constituents, or if other than acid-fast bacilli are injected, no changes in the leucocytes occur. Blood (or serum) of tuberculous patients, injected into guinea pigs, induces the same granular changes as sputum, pleural fluid etc., and here again the amount of granulations thus induced is related to the degree and the evolution of the disease, whereas blood (or serum) from healthy individuals or from patients suffering from conditions other than tuberculosis does not induce any changes in the morphology of leucocytes. If serum or blood, capable of inducing granulations, is filtered through a Chamberland filter No. 5, no modifications are induced, or if they do occur their appearance is greatly delayed and they do not correspond to changes induced by the same material in unfiltered state. The finding of type G+ or G++ granulations in man is therefore very suggestive of tuberculosis, whereas a normal

granulogram eliminates, at least temporarily, the diagnosis of tuberculosis. G± granulations are found in arrested or initial cases of tuberculosis. The granulodiagnosis may be important in the screening of suspected individuals, in the differential diagnosis of pneumonia and in the examination of pathological material, such as pleural fluid and sputum. The changes observed are by no means pathognomonic, but importance is attached to these findings for the diagnosis and the prognosis of tuberculosis. It seems that blood from tuberculous patients, only exceptionally containing bacilli, nevertheless does contain a substance capable of modifying the granulations contained in neutrophil leucocytes of guinea pigs.—*Les granulations "pathologiques" des polynucléaires neutrophiles chez les tuberculeux et au cours de la tuberculose expérimentale du cobaye, J. Niclas, Presse méd., February, 1942, No. 17, 213.*—(*G. Simmons*)

Anemia in Pulmonary Tuberculosis.—Of 150 patients with different forms of pulmonary tuberculosis a varying percentage of 15 to 50 per cent (different percentages were encountered in the different groups in which the patients were divided according to the type of disease and its stage) showed anemia of the hyperchromic type with a color index greater than 1. This type of anemia, which however could be differentiated morphologically from the pernicious type, was observed only in stationary cases. In mild and in severe progressive cases the anemia was always hypochromic. It is believed that anemia in these cases is due to a toxic effect on the bone marrow rather than to hemolysis.—*Contibuto alla conoscanza delle alterazioni ematologiche nella tubercolosi polmonare, M. Nuti, Ann. Ist. Carlo Forlanini, 1942, 6: 3.*—(*G. Simmons*)

Bilirubinemia in Tuberculosis.—In febrile and progressive cases of pulmonary tuberculosis bilirubinemia increases. It decreases and turns normal as the disease regresses. Where there are associated intestinal disturbances, the bilirubinemia is persistently elevated. In pulmonary tuberculosis associated with syphilis, the bilirubinemia is very high. In stages of anergia, the bilirubinemia returns to normal limits.—*Bilirubinemia fisiologica e bilirubinemia nei vari quadri di tubercolosi polmonare, A. Cimino, Ann. Ist. Carlo Forlanini, 1942, 6: 252.*—(*G. Simmons*)

PH of Intracavitary Contents.—The PH of the intracavitary contents is acid and turns alkaline during a successful intracavitary aspiration process. The aspiration, it is believed, causes a flow of liquids from the periphery toward the interior of the cavity. These liquids play an important part in the improvement of cellular metabolism.—*Il comportamento del PH nei liquidi endocavitari durnate il trattamento aspirativo, G. Zirilli, Ann. Ist. Carlo Forlanini, 1942, 6: 267.*—(*G. Simmons*)

Glycolysis *in vitro* in Tuberculosis.—Glycolysis, studied *in vitro*, in the blood of tuberculous patients was found to be increased as compared to that of the blood of healthy individuals. The increase is proportionate to the degree of toxemia.—*La glicolisi in vitro studiata in rapporto alla tossiemia tubercolare, A. Baffoni, L. Rupoli & M. Spadoni, Ann. Ist. Carlo Forlanini, 1942, 6: 53.*—(*G. Simmons*)

PH of Pleural Fluids.—Clear pleural fluid complicating a pneumothorax has an alkaline reaction very near that of the blood. Fluids from empyemata, however, are acid. The acid reaction becomes less pronounced and eventually may turn alkaline as the case becomes chronic. It is believed that the reaction depends not only on the number of pus cells, but particularly upon the presence of metabolic processes and metabolic exchanges that take place between the fluid and blood.—*Il comportamento del P H nei liquidi parapneumotoracici semplici e purulenti, G. Zirilli, Ann. Ist. Carlo Forlanini, 1942, 6: 10.*—(*G. Simmons*)

Patch and Mantoux Tests in Dermatoses.—Despite an occasional contradictory report the concensus seems to be that the patch method of testing is efficient and compares favorably with the intracutaneous technique in detecting skin sensitiveness to tuberculin. These conclusions were arrived at by testing healthy persons and those suffering from nontuberculous internal disease. There are no reports in which the efficacy of the Mantoux and patch test techniques in tuberculous and nontuberculous dermatoses are compared. Two hundred patients with various dermatological diseases were tested with tuberculin employing the intracutaneous and patch methods simultaneously. Twenty-four of these patients were suffering from various tuberculoderms. A high degree of uniformity in the incidence of positive reactions to the Mantoux test with Old Tuberculin, the patch test with Old Tuberculin and the Vollmer patch test (used in 167 cases) was found. Some disparities occurred, the cause of which remains unknown. There was no significant difference observed between the appearance of the patch test reactions in patients with tuberculoderms and in those with nontuberculous eruptions. It should be noted, however, that in 2 patients with lupus vulgaris the reaction at the site of the patch test was so severe as to cause considerable discomfort. It follows that in the presence of a tuberculoderm associated with a high sensitiveness to tuberculin (tuberculosa luposa, verrucosis cutis and verrucosis colliquativa) the use of patch tests with full strength Old Tuberculin, as is ordinarily employed, is not advisable.—*Tuberculin Patch Test and Mantoux Test: Comparative Study in Cases of Various Dermatoses, Including Tuberculoderms, F. Pascher & M. B. Sulzberger, Arch. Dermat. & Syph., April, 1944, **49:** 256.—(J. S. Woolley)*

Sensitivity to Tuberculin in Acne.—The possibility of a relationship between acne and tuberculosis has interested many observers. The present report considers the Mantoux reactions of a large number of university students with and without acne. Tests were made with the 1:10,000 dilution of tuberculin, and if a reaction did not appear, with the 1:100 strength. Of 13,748 students, 3,549 reacted to tuberculin. Eight hundred and eighty-nine of the latter had acne. In this group the incidence of positive skin-tests was 22 per cent, in contrast to 27 per cent in the no acne group. The author considers this difference to be of statistical significance.—*Lessened Sensitivity to Tuberculin in Acne, T. W. Lynch., Arch. Dermat. & Syph., March, 1944, **49:** 174.—(J. S. Woolley)*

Transplacental Tuberculous Infection.—The transmission of tuberculosis from the mother to the fetus was studied experimentally. Twelve rabbits were subcutaneously inoculated with avian tubercle bacilli. Blood cultures were made during pregnancy and in the litter, after delivery. The avian tubercle bacilli produce a chronic type of tuberculosis, which permits the rabbit to live up to twelve months, and in this way several successive gravidities could be observed. It has thus been possible to study the transmission of the bacilli during various different stages of the disease in the mother. Positive transplacental transmissions of avian bacilli to the fetus were shown in 36.66 per cent, most of which took place between the third and sixth month of the disease, in other words, when it was at its apex. In 60 per cent of the positive cases, bacillemia in the mother was also recorded, whereas they were not found in any of the negative cases. According to these findings, the placenta is apparently subject to periodic discharges of tubercle bacilli, which, when repeated with intensity, makes the placenta permeable to the bacilli. The passing through of the bacilli preferably takes place during the second half of pregnancy, when the histological layers of the placenta become thinner, and the enzymatic capacity of the cells decrease. On the other hand, it may be deduced, from the study of the tuberculous rabbits which were pregnant several times, that pregnancy does not seem to aggravate pulmonary tuberculosis in the mother. Attention is also called to the small proportion

(3.63 per cent) of abortions and premature deliveries in this experimental study. In a second series of studies, 26 guinea pigs were inoculated intracardially with avian bacilli, and were killed shortly thereafter. In these cases acute tuberculosis was obtained. There were 53.85 per cent of transplacental transmissions, and tubercle bacilli were found in the fetal organs and in the amniotic fluid as early as thirty to sixty minutes after inoculation. The fact that, in spite of the existence of tuberculosis of the placenta in 100 per cent of the cases, only half of the fetus were found to be infected shows that this has not been a mere mechanical outflow of the bacilli through the placenta. On the other hand, according to findings of other observers, a great majority of the transplacental transmissions of germs take place in the presence of a normal placenta. Transmission is therefore due to the virulence itself of the microbe. It is noted that tuberculous microscopic lesions were not found in any of the fetus which were positive in the bacteriological investigation. This discrepancy is probably due to the low ability to react of the fetal organs, when confronted with the tubercle bacilli.—*Pasaje transplacentario del bacilo de Koch, estudio experimental, H. V. Vaccaro & L. Paredes, Ap. respir. y tuberc. (Chile), January-March, 1945, 10: 11.*—(*H. Behm*)

Sterilization of Tuberculous Lesions.—Sterilization of tuberculous lesions and loss of tuberculin sensitivity, as can be observed in man, never occur in the guinea pig, because tuberculosis in the guinea pig, no matter how small the number of bacilli introduced, is always a fatal disease and is not comparable to the common type of reinfection tuberculosis in man. It is comparable to the malignant primary human tuberculosis, in which sterilization of lesions never occurs. However, in guinea pigs too, a latent form of tuberculosis can be induced by injecting very attenuated germs, and in the disease thus produced sterilization of lesions and loss of tuberculin sensitivity can be observed. Objections can be raised to such a technique. But in the experimental reproduction of the human type of reinfection tuberculosis not the virulence of the germ is important but the relation between the virulence and the resistance of the body. The resistance of the guinea pig to tuberculosis is obviously too slight to cope with the normally virulent type of tubercle bacillus, but by reducing this virulence it is possible to induce a relation such as exists in man and it is possible to create a condition more closely resembling the human reinfection type of tuberculosis. After injecting a guinea pig with 1 mg. of BCG the tuberculin sensitivity thus produced in the animal only rarely persists for more than ten months. Similarly, tuberculin sensitivity induced by any other attenuated strain disappears after some time. The persistence of such sensitivity depends upon the constitution of the animal. There is a long interval between the sterilization of lesions that had become latent and the moment when tuberculin sensitivity disappears. Experiments have shown that, whereas lesions may become sterile after three months, the tuberculin reaction remains positive for twelve and more months. Thus the substratum of a tuberculin reaction may be something other than living tubercle bacilli. A new infection, following spontaneous loss of tuberculin sensitivity, produces new tuberculin sensitivity, which sets in much more promptly and testifies to the fact that, whereas cutaneous allergy had disappeared, general allergy—that is the ability to react "differently"—had persisted.—*Quelques considérations expérimentales sur les notions de stérilisation des lésions tuberculeuses et d'extinction de la sensibilité tuberculinique récemment étudié chez l'homme, A. Saenz, Presse méd., November, 1940, No. 93/94, 955.*—(*G. Simmons*)

Chronic Chlorine Poisoning and Tuberculosis.—Groups of guinea pigs were exposed to prolonged inhalations of light concentrations of chlorine before and after infection with tuberculosis. It appears from the results obtained that chronic chlorine poisoning favors the evolution of experimental tuber-

culosis in guinea pigs. Individuals employed in industries where they may be exposed to chlorine fumes should be screened for any evidence of tuberculosis and should be followed clinically and radiologically during the period of employment.—*Action de l'intoxication chronique par une atmosphère de chlore a faible concentration sur la tuberculose expérimentale du cobaye, F. Arloing, E. Berthet & J. Viallier, Presse méd., April, 1940, No. 33/34, 353.*—(*G. Simmons*)

Precipitin Test for Tuberculin Antibodies.—It has been demonstrated that killed bacteria could be coated with antigen and that such antigen-coated cells made possible the detection of extremely small amounts of antibody; therefore, it was decided to attempt to coat bacteria with tuberculin for the purpose of developing a quantitative precipitin test against tuberculin. *Serratia marcescens* were used because of their small uniform size. The killed cell suspension was diluted so that the nitrogen content was the same as the 0.5 per cent dilution of Old Tuberculin. Equal portions of the dilute cell suspension and 0.5 per cent Old Tuberculin were mixed and incubated at 37.5°C. for twelve hours. The Old Tuberculin was adsorbed on the cells in this interval. The mixture was then centrifuged and the coated cells were washed twice with saline to remove any excess or free Old Tuberculin. The coated cells were finally suspended in physiological saline (pH 6) to a density equivalent to a reading of 70 on the Klett-Summerson photoelectric colorimeter, using a green filter (540 mu). This suspension was used as the antigen for the test. Five-tenths cc. of antigen was added to serial dilutions of serum ranging from 1:8 to 1:2,048; the tubes were shaken vigorously for five minutes and incubated at 37.5°C. for two hours. The test was read at this time, then placed in a refrigerator at 8°C. for twelve hours, and reread after being allowed to warm up to room temperature. Positive tests were manifested by a fine granular precipitate, best read against a blue light in a darkened room. Two control tubes, namely, coated cells and saline, and uncoated cells and serum should always be included for each test. It is imperative that the following precautions be observed: (*1*) Antigen, serum, and saline must be sterile. (*2*) Antigen, that is, coated cells, must be prepared daily or be kept frozen in a deep-freeze refrigerator at —20°C. (*3*) The test must not be left in the refrigerator for more than twenty-four hours or false positive tests will result. (*4*) The precipitate is extremely fine and requires great care and considerable skill for accurate reading. The results obtained with the sera of 12 tuberculous guinea pigs were as follows: 10 developed antibodies but the titers varied from 1:2 to 1:128, one animal failed to develop antibodies and one animal died during the first week of the experiment. The sera of 8 tuberculin-positive and 8 tuberculin-negative patients were tested. One tuberculin-negative individual had antibodies in serum with a titer of 1:128, while all of the tuberculin-positive individuals had positive tests with titers ranging from 1:16 to 1:64. Thirteen sera from patients with active tuberculosis had titers ranging from 1:64 to 1:1,024 and twelve sera from patients with arrested tuberculosis had titers ranging from 1:32 to 1:256. The results obtained suggest that the antibody titer is significantly different in active and inactive tuberculosis and that individuals who do not react to Old Tuberculin by skin test will not have antibodies in the serum. This study is of a preliminary nature, but seems to be of sufficient constancy and interest to justify its presentation.—*Precipitin Test for Tuberculin Antibodies, R. O. Muether & W. C. MacDonald, J. Lab. & Clin. Med., May, 1945, 30: 411.*—(*F. G. Petrik*)

Fatty Liver.—Among 35 cases of chronic pulmonary tuberculosis that came to autopsy only 3 showed fatty livers and these patients had been rather stout. In two-thirds of the cases examined there was evidence of a typical inflammatory process without evidence of fatty degeneration. Periportal sclerosis was observed only rarely, but massive proliferation of Kupfer's cells was an almost constant

feature. Fat deposition in the liver cells usually starts at the periphery of the hepatic lobule. In order that fat may be deposited, it is necessary for the body to have sufficient reserves in lipids and glucosides and the endocrine system must be functioning normally. A very important factor in the development of fatty deposits is anoxemia. Fatty degeneration was found in livers of aviators flying at high altitudes and could be induced artificially by exposing experimental animals to an atmosphere poor in oxygen over varying periods of time. In the course of chronic pulmonary tuberculosis there is always anoxemia present which is, if not an essential, at least an important additional factor in the development of fatty liver in individuals having sufficient lipoid reserves.—*Considération sur le mécanisme de la stéatose hépatique chez les tuberculeux, P. Florentin, R. Grandpierre, P. Grognot & J. Royer, Presse méd., November, 1943, No. 43, 630.—(G. Simmons)*

Chemistry of Tubercle Bacilli.—The aggressive properties of Koch's bacilli are due to lipid substances, particularly those with fatty chains with an acid radical, which have ramifications in α position. These substances, when injected into a guinea pig previously infected with Koch's bacillus, are able to induce Koch's phenomenon in the animal thus treated and are able to produce allergy and immunity in healthy animals. These substances can be prepared synthetically and they assume an importance in tuberculosis similar to that of certain polysaccharides in pneumococcic infections.—*Orientation nouvelle de chimisme bactérien au cours de la tuberculose: Application pratiques, J. Paraf & J. Desbordes, Presse méd., June, 1943, No. 11, 163.—(G. Simmons)*

Activation of Specific Proteolytic Enzymes.—The influence of short waves on specific proteolytic enzymes first described by Abderhalden and found in the urines of patients with pulmonary tuberculosis was examined. It was found that these enzymes increase under the action of short waves. It is assumed that short waves cause stimulation of the vagus, which in turn brings about changes in the oxido-reductive mechanisms and determines an increase in the proteolytic enzymes. —*L'attivazione delle proteasi specifiche di difesa: Influenza delle onde corte, F. Ingrao & A. Valli, Ann. Ist. Carlo Forlanini, 1942, 6: 741.—(G. Simmons)*

Antibodies in Tuberculosis.—In severe caseous pulmonary tuberculosis it is impossible to get an increase of the skin reaction to injection of tuberculin, whereas in productive fibrous processes repeated skin tests revealed an increase of the skin sensitivity to tuberculin. There is a relationship between the reticulo-endothelial system and skin sensitivity, because in those cases in which, following injection of Congo red, the dye was absorbed readily the skin sensitivity was greater than in those in which the reticulo-endothelial system was paralyzed (decreased retention of dye). An increase of the antibodies can be obtained after a specific stimuli, such as exposure of the spleen to X-rays. This was proved by means of passive transmission of antibodies in the blood; 171 experiments of passive transmission were made with 65 blood sera. If the serum was obtained from a person who had a tuberculin injection twenty-four hours before, in 72.5 per cent of the recipients the skin sensitivity to tuberculin increased. With serum obtained twenty-four hours after irradiation of the spleen the skin sensitivity of 87.5 per cent of the recipients increased. In the control series (serum from not treated tuberculous patients) passive transmission was obtained in only 28 per cent.—*Ueber die Rolle humoraler Antikoerper in der Tuberkulos allergie, J. Alfoeldy, Ztschr. f. Tuberk., 1942, 89: 52.—(G. Simmons)*

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